3.15 Parametric Equations & Motion

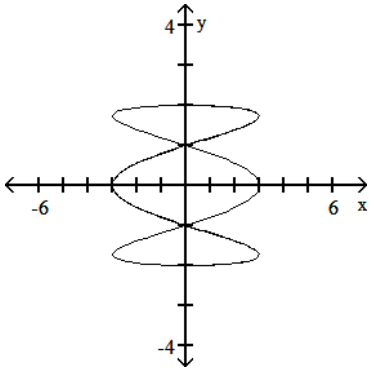
Name_____ Date _____ Period _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

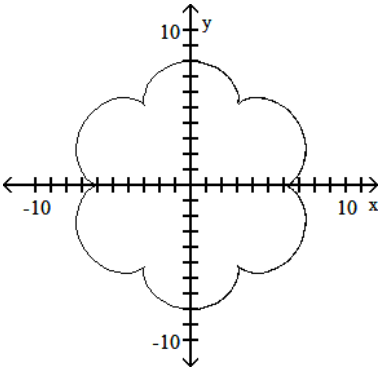
Find the graph of the given parametric equations.

1) $x = 3 \sin^3 t$, $y = 3 \cos^3 t$ 1) _____

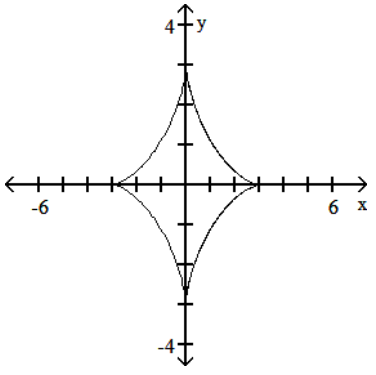
A)



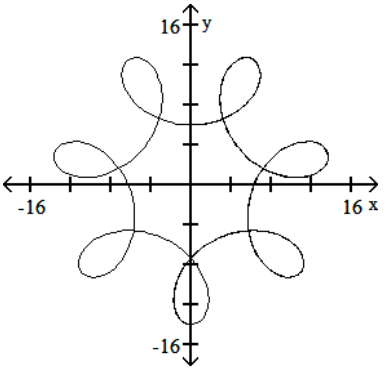
B)



C)

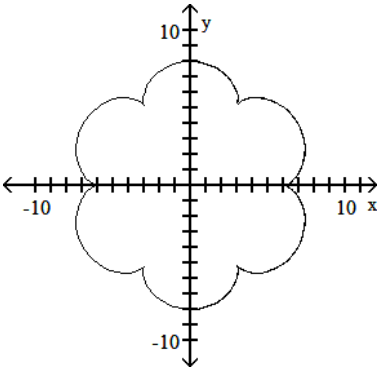


D)

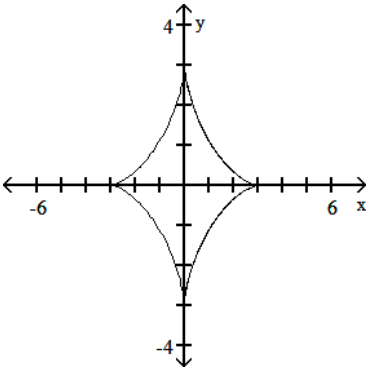


2) $x = 7 \sin t + \sin 7t$, $y = 7 \cos t + \cos 7t$ 2) _____

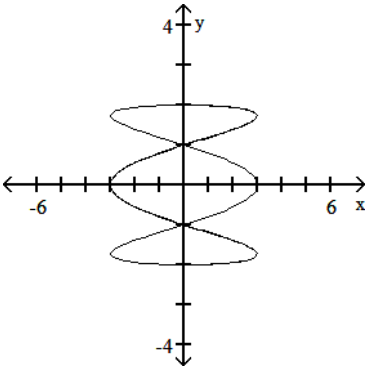
A)



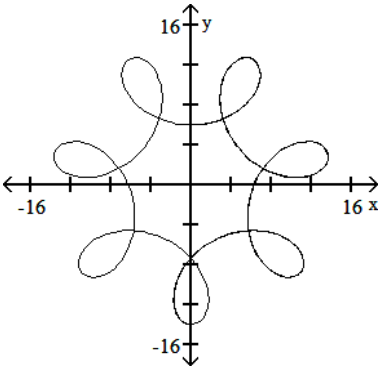
B)



C)



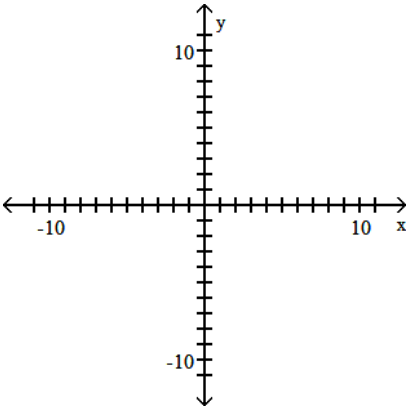
D)



SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Graph the pair of parametric equations.

3) $x = 2t$, $y = t + 4$, $-2 \le t \le 3$ 3) _____



Eliminate the parameter.

4) $x = 1 + t$, $y = t$ 4) _____

5) $x = 2t - 3$, $y = 9 - 4t$, $3 \le t \le 5$ 5) _____

6) $x = t^2$, $y = t + 1$ 6) _____

7) $x = t$, $y = t^3 - 2t + 3$ 7) _____

8) $x = 4 - t^2$, $y = t$ 8) _____

9) $x = t - 3$, $y = \frac{2}{t}$, $-5 \le t \le 5$ 9) _____

10) $x = 2 \sin t$, $y = 2 \cos t$, $0 \le t \le 3\pi/2$ 10) _____

Solve the problem using a graphing calculator.

11) Determine the approximate distance that a baseball travels if it is thrown with a velocity of 97 feet per second at an angle of 30° relative to level ground. 11) _____

12) Estimate the maximum height reached by a baseball during its flight if it is thrown with a velocity of 102 feet per second at an angle of 58° relative to level ground. 12) _____

13) Determine whether a baseball hit 136 feet per second at an angle of 30° relative to level ground will clear a 10-foot wall 400 feet away. 13) _____

14) Determine which will travel farther: baseball x hit 102 feet per second at an angle of 35° relative to level ground or baseball y hit 124 feet per second at an angle of 30°. 14) _____

15) Anne can sprint at a rate of 21 ft/sec. Carol can sprint at 26 ft/sec. Carol gives Anne a 14-ft head start. The parametric equations below can be used to model a race. 15) _____

$x_1 = 21t$, $y_1 = 3$

$x_2 = 26t - 14$, $y_2 = 5$

Find a viewing window to simulate a 200-yd dash. Graph simultaneously. Who is ahead after 8 seconds and by how much?